



**Gold Standard**<sup>®</sup>  
for the Global Goals

TEMPLATE

# MONITORING REPORT

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PUBLICATION DATE **14.10.2020**

VERSION **v. 1.1**

RELATED SUPPORT – **TEMPLATE GUIDE Monitoring Report v. 1.1**

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This document contains the following Sections

Key Project Information

SECTION A - Description of project

SECTION B - Implementation of project

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SECTION D - Data and parameters

SECTION E - Calculation of SDG Impacts

SECTION F - Safeguards Reporting

SECTION G - Stakeholder inputs and legal disputes

## KEY PROJECT INFORMATION

### Programme of Activity Information – (delete below table if N/A)

<b>GS ID of Programme</b>	GS1247
<b>Title of Programme</b>	GS1247 Improved Kitchen Regimes Multi-Country POA
<b>Version of POA-DD applicable to this monitoring report</b>	GS1247 IKR Micro PoA-DD CP2 v14
<b>Name and GS ID of fully Validated CPA/VPAs (i.e. non compliance check)</b>	GS1247 VPA 203-12 Sierra Leone Safe Water (GS7475 – GS7484)

### Key Project Information

<b>GS ID (s) of Project (s)</b>	GS7475 – GS7484
<b>Title of the project (s) covered by monitoring report</b>	GS1247 VPA 203 Sierra Leone Safe Water (GS7475) GS1247 VPA 204 Sierra Leone Safe Water (GS7476) GS1247 VPA 205 Sierra Leone Safe Water (GS7477) GS1247 VPA 206 Sierra Leone Safe Water (GS7478) GS1247 VPA 207 Sierra Leone Safe Water (GS7479) GS1247 VPA 208 Sierra Leone Safe Water (GS7480) GS1247 VPA 209 Sierra Leone Safe Water (GS7481) GS1247 VPA 210 Sierra Leone Safe Water (GS7482) GS1247 VPA 211 Sierra Leone Safe Water (GS7483) GS1247 VPA 212 Sierra Leone Safe Water (GS7484)
<b>Version number of the PDD/VPA-DD (s) applicable to this monitoring report</b>	3
<b>Version number of the monitoring report</b>	2

<b>Completion date of the monitoring report</b>	09/09/2022
<b>Date of project design certification</b>	10/02/2020
<b>Date of Last Annual Report</b>	N/A
<b>Monitoring period number</b>	3 <sup>rd</sup> (See Section B.2.5. for details).
<b>Duration of this monitoring period</b>	19/05/2021-18/05/2022 (See Section B.2.5. for details).
<b>Project Representative</b>	Oscar Lozada – CO2balance
<b>Host Country</b>	Sierra Leone
<b>Activity Requirements applied</b>	<input checked="" type="checkbox"/> Community Services Activities <input type="checkbox"/> Renewable Energy Activities <input type="checkbox"/> Land Use and Forestry Activities/Risks & Capacities <input type="checkbox"/> N/A
<b>Methodology (ies) applied and version number</b>	TPDDTEC v1
<b>Product Requirements applied</b>	<input checked="" type="checkbox"/> GHG Emissions Reduction & Sequestration <input type="checkbox"/> Renewable Energy Label <input type="checkbox"/> N/A

**Table 1 - Sustainable Development Contributions Achieved**

<b>Sustainable Development Goals Targeted</b>	<b>SDG Impact</b>	<b>Amount Achieved</b>	<b>Units/ Products</b>
SDG 13 Climate Action	Emissions Reductions	GS7475: 5,161 (15,540) GS7476: 5,252 (15,685) GS7477: 5,308 (15,877) GS7478: 4,933 (16,109) GS7479: 4,258 (11,469) GS7480: 5,254 (15,856) GS7481: 4,775 (14,471) GS7482: 5,448 (15,353) GS7483: 5,631 (17,312) GS7484: 5,445 (16,185) Total: 51,465 (153,465)	tCO <sub>2</sub> e
SDG 3 Good Health and Wellbeing	Reduction in incidences of stomach related	70% (all VPAs)	IR <sub>y</sub>

	illnesses or water-borne diseases		
SDG 5 Gender Equality	Reduction in time spent collecting water	61% (all VPAs)	TR <sub>y</sub>
SDG 6 Clean Water and Sanitation	Additional people gaining access to safe water	GS7475: 3,631 GS7476: 3,631 GS7477: 3,631 GS7478: 3,352 GS7479: 3,631 GS7480: 3,631 GS7481: 3,631 GS7482: 3,910 GS7483: 3,910 GS7484: 3,910 Total: 36,868	P <sub>access</sub>

**Table 2 – Product Vintages**

Start Dates	End Dates	Amount Achieved			
		tCO <sub>2</sub> e	IR <sub>y</sub>	TR <sub>y</sub>	P <sub>access</sub> (People)
19/05/2021	31/12/2021	GS7475: 3,052 GS7476: 3,143 GS7477: 3,199 GS7478: 2,986 GS7479: 2,149 GS7480: 3,145 GS7481: 2,666 GS7482: 3,177 GS7483: 3,360 GS7484: 3,174 Total: 30,051	70% (all VPAs)	61% (all VPAs)	GS7475: 3,631 GS7476: 3,631 GS7477: 3,631 GS7478: 3,352 GS7479: 3,631 GS7480: 3,631 GS7481: 3,631 GS7482: 3,910 GS7483: 3,910 GS7484: 3,910

					Total: 36,868
01/01/2022	18/05/2022	GS7475: 2,109 GS7476: 2,109 GS7477: 2,109 GS7478: 1,947 GS7479: 2,109 GS7480: 2,109 GS7481: 2,109 GS7482: 2,271 GS7483: 2,271 GS7484: 2,271 Total: 21,414	70% (all VPAs)	61% (all VPAs)	GS7475: 3,631 GS7476: 3,631 GS7477: 3,631 GS7478: 3,352 GS7479: 3,631 GS7480: 3,631 GS7481: 3,631 GS7482: 3,910 GS7483: 3,910 GS7484: 3,910 Total: 36,868

## SECTION A. DESCRIPTION OF PROJECT

### A.1. General description of project

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CO2balance is implementing 10 micro-scale VPAs in Kono, Kenema, and Kailahun Districts, Sierra Leone, under the Gold Standard methodology *Technologies and Practices to Displace Decentralized Thermal Energy Consumption*. The project activity involves rehabilitating non-functioning boreholes to provide villages with a source of safe water. This displaces the baseline method of water treatment, which involves boiling water using solid fuel. The project activity removes the need of households to rely on firewood and coal to boil water and therefore reduces CO2 emissions.

The 57 boreholes were rehabilitated between the 19<sup>th</sup> May 2019 to the 1<sup>st</sup> February 2020; an additional 75 boreholes were rehabilitated between 17<sup>th</sup> April 2020 and 28<sup>th</sup>

August 2020. The crediting periods for each VPA are given in section A.4 and have a lifetime of 7 years. This monitoring period covers 19/05/2021 - 18/05/2022 for Phase 1 and Phase 2 boreholes, and as part of the requirements, all boreholes were checked on a quarterly basis during the period. All boreholes can be confirmed as operational with only a few minor problems, that needed maintenance and or repairs. Common problems were low water discharge, disconnected rods and broken pump head, all which could be repaired without detriment to the water supply. An overview of the number of non-functional days is shown below, this value also takes into account days when the boreholes did not provide safe water, as accounted for by quarterly Water Quality Testing.

BH ID	Borehole Name	District	Total No. of Failure Days
KON-01	Chief Compound water point	Kono	105
KON-02	Open Eye Water Point	Kono	2
KON-24	KDEC School water point	Kono	70
KAI-06	R. C. One School Compound Borehole	Kailahun	88
KAI-07	Paris Section Borehole	Kailahun	90
KON-15	Benduma Road Borehole	Kono	104
KAI-11	Bongalo Section Borehole	Kailahun	88
KAI-12	Jewaru Section Borehole	Kailahun	86
KON-09	Aiah Komba Compound water point	Kono	69
KON-17	Ndomaina Compound Water point	Kono	71
KAI-17	One Mile Borehole	Kailahun	89
KAI-21	Golawoma Quarter Borehole	Kailahun	1
KON-32	Sheku Koroma compound Borehole	Kono	3
KAI-23	Kosiala Borehole	Kailahun	89
KAI-25	Barka Section Borehole	Kailahun	92
KON-23	KDEC School water point	Kono	77
KON-26	ABC Store water point	Kono	78
KON-20	Sahr Bobor Compound Borehole	Kono	71
KON-25	KDEC School water point	Kono	70
KEN-15	Chief Brima Foday Compound Borehole	Kenema	104

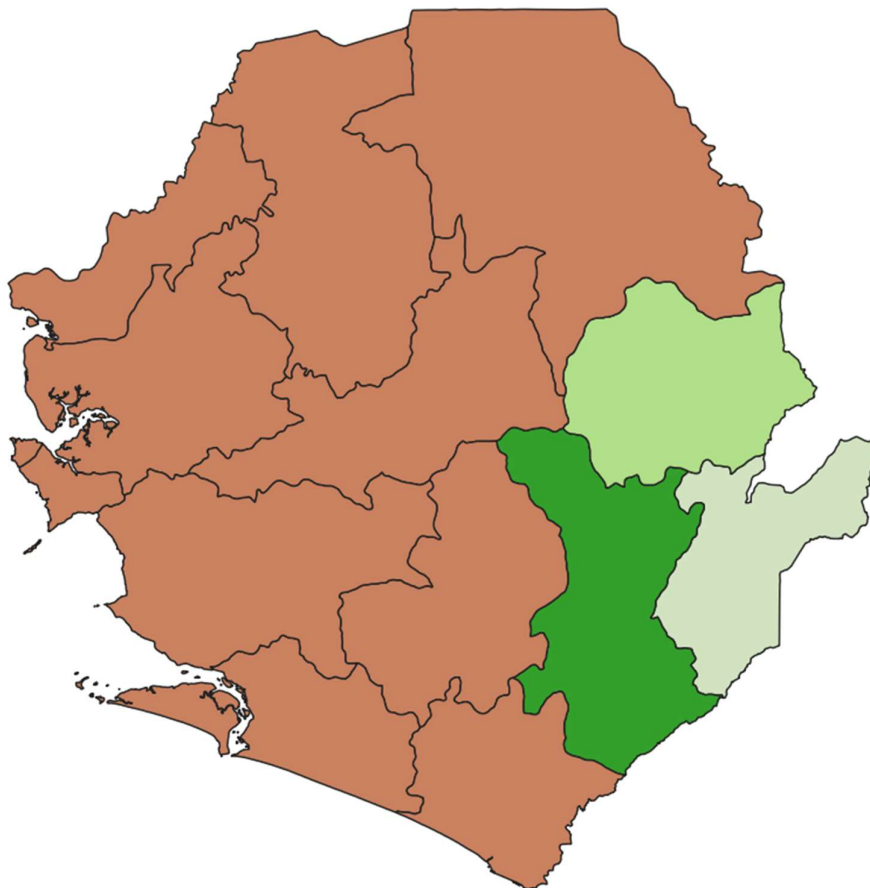
KON-19	Sumaila Koroma Compound Borehole	Kono	105
KEN-26	Mdm. Iye Banya's Compound Borehole	Kenema	104
KEN-28	Silla's Compound Borehole	Kenema	101
KEN-29	Chief Compound Borehole	Kenema	101
KEN-30	O.C Quarter's Borehole	Kenema	104
KEN-31	Pa Kennedy's Compound Borehole	Kenema	104
KEN-32	Mdm. Mamie Daniel Compound Borehole	Kenema	104
KON-27	Johnny Compound Water Point	Kono	1
KAI-31	Sundufula Borehole	Kailahun	95
KAI-33	Kongorhun Road Borehole	Kailahun	90
KAI-34	Makor Central Borehole	Kailahun	90
KON-06	Masundu central Borehole	Kono	105
KEN-13	One Mile Borehole	Kenema	104
KEN-11	Jimmy section borehole	Kenema	104
KON-08	Saardu Junction water point	Kono	105
KAI-36	Njagor Section Borehole	Kailahun	86
KAI-38	Sahr Bockarie Compound	Kailahun	90
KAI-41	Gietibu Section Borehole	Kailahun	89
KEN-04	Madam Cecilia Koroma Compound Borehole	Kenema	1
KEN-02	Samala Compound Borehole	Kenema	104
KEN-08	Koromba 1 Section borehole	Kenema	1
KAI-44	Kissy Town Market Borehole	Kailahun	89
KAI-46	Tokpombu Borehole	Kailahun	86
KAI-47	Mofindor Road Borehole	Kailahun	89
KON-35	Mdm Sia Marie Compound Borehole	Kono	106
KEN-18	Temne Town Borehole	Kenema	105
KEN-05	Abdul Bangura Compound Borehole	Kenema	107
KEN-21	Kuwahun borehole	Kenema	105
KON-41	Komba Fomba Compound Borehole	Kono	1
KON-44	Saffea Koroma Compound Borehole	Kono	2

KEN-16	Thomas Samai Compound Borehole	Kenema	105
KEN-06	Nyagbebo Road Borehole	Kenema	104
KAI-48	Bambawo Section Borehole	Kailahun	90
KAI-51	Gbessay Juana Compound Borehole	Kailahun	90
KAI-52	Belebu Section Borehole	Kailahun	89

## A.2. Location of project

>>

This project is located in Kono, Kenema, and Kailahun Districts, in the Eastern Provinces of Sierra Leone. Below is the geographic reference to allow unique identification of the project boundary. The target area and the fuel collection area are defined as being contained within project boundary, with the outer limits of the project boundary being clearly defined below. As the majority of beneficiaries collect their wood fuel locally in close proximity to their homesteads, the wood fuel collection area and target area are considered the same.



<b>Project Area Coordinates</b>		
	Latitude	Longitude
North	9°59'59.32"N	11°53'39.77"W
South	6°55'3.04"N	11°27'24.86"W
East	8°28'46.04"N	10°16'31.33"W
West	9° 1'51.84"N	13°18'10.96"W
Kono	8°45'N	11°00'W
Kenema	7°50'N	11°10'W
Kailahun	8°10'N	10°45'W

### **A.3. Reference of applied methodology**

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The applied methodology is Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1.0 (TPDDTEC).

### **A.4. Crediting period of project**

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GS7475: 19/05/2019 – 18/05/2026

GS7476: 20/05/2019 – 19/05/2026

GS7477: 13/06/2019 – 12/06/2026

GS7478: 28/06/2019 – 27/06/2026

GS7479: 29/07/2019 – 28/07/2026

GS7480: 04/08/2019 – 03/08/2026

GS7481: 14/11/2019 – 13/11/2026

GS7482: 14/11/2019 – 13/11/2026

GS7483: 23/01/2020 – 22/01/2027

GS7484: 26/11/2019 – 25/11/2026

Each crediting period has a length of 7 years, under the TPDDTEC v1 Methodology.

## SECTION B. IMPLEMENTATION OF PROJECT

### **B.1. Description of implemented project**

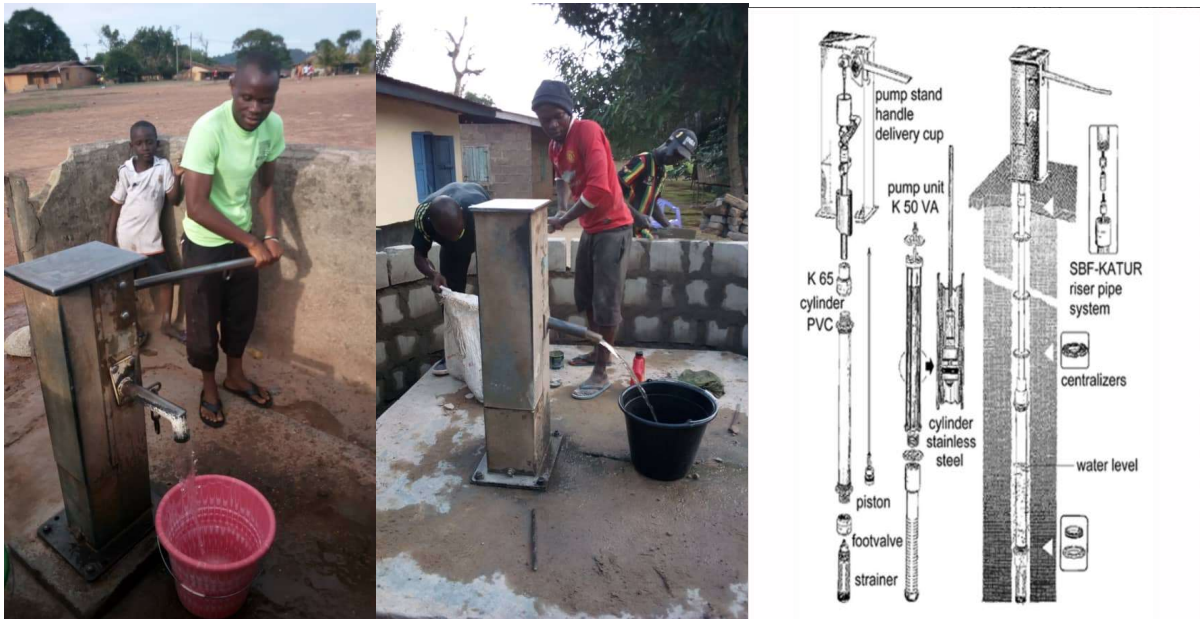
>>

In partnership with Community Organization for Development and Empowerment – Sierra Leone (CODE-SL), CO2balance UK Ltd is implementing a number of Micro-Scale Voluntary Project Activities under PoA 1247 in the districts of Kono, Kenema, and Kailahun which are eligible under the Gold Standard methodology *Technologies and Practices to Displace Decentralized Thermal Energy Consumption version 1*. Local people typically use wood fuel on inefficient three stone fires for cooking and water purification, which results in the release of greenhouse gas emissions from the combustion of wood. This can be avoided if a technology that does not require fuel (wood or fossil) supplies clean water desired by households.

Kono, Kenema, and Kailahun are largely rural Districts in which local people typically use wood fuel on inefficient three-stone fires to purify their drinking, cleaning and washing water. This process results in the release of greenhouse gas emissions from the combustion of wood. This can be avoided if a technology that does not require fuel (wood or fossil), supplies the clean water desired by households. Many existing boreholes are owned by community groups and have fallen into disrepair because maintenance programmes have been poorly managed or proven too expensive. In this project CO2balance UK Ltd, work with community groups and a local NGO partner, CODE-SL in these Districts, to identify broken down boreholes and renovate them so that they deliver clean, safe water and breakdowns are fixed rapidly. To this end, quarterly visits are scheduled to each borehole, whereby the field partner conducts a survey on the functionality of each borehole, and if necessary, service and replaces parts. The majority of maintenance is reactive, however a programme of proactive flushing of at-risk boreholes was conducted in April prior to the onset of the rainy season.

The date of rehabilitation was confirmed by a Repair Confirmation Form, which was signed by the mechanic employed by the local NGO partner, carrying out the repair along with an elected representative of the community group owners of the borehole. The date of rehabilitation was used as the start date of operation and crediting for each borehole; we have conservatively assumed that the first day of crediting is not counted.

The boreholes included under the project are entirely human operated and fitted with hand pump Kardia-65, Kardia-2000 and India Mark 2 models. The depth of the boreholes are limited to 100m or less. The main differences between 65 and 2000 models are that the piston consists of 4 seals for Kardia 2000 and 5 for Kardia 65, the rubber seating differing between the two and the need for a reducer to tighten the screen pipe on K2000 while it is not necessary on K65.



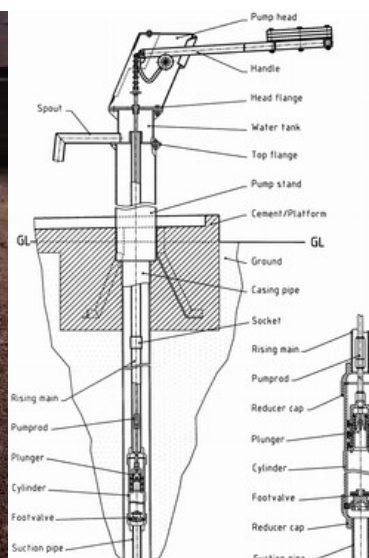
**Left image: Kardia-2000 pump in action from the project in Sierra Leone (Source: CO2balance)**

**Middle image: Kardia-65 pump in action from the project in Sierra Leone (Source: CO2balance)**

**Right image: specification of a Kardia pump (Source: Red Cross<sup>1</sup>)**

	Kardia 65/2000
Cylinder diameter (mm):	62
Maximum Stroke (mm):	125
Approx. discharge (75 watt input):	at 10 m head: 1.4 m <sup>3</sup> /hour,
	at 15 m head: 1.1 m <sup>3</sup> /hour,
	at 20 m head: 0.9 m <sup>3</sup> /hour,
	At 30 m head: 0.7 m <sup>3</sup> /hour
Pumping lift (m):	10-50
Water consumption (lpcd):	15-20
Max number of Users	350

<sup>1</sup> <https://itemscatalogue.redcross.int/wash--5/water--29/hand-pumps--44/hand-pump-kardia--WPUHSURW03.aspx>



**Left image: India Mark 2 pump in action from the project in Sierra Leone (Source: CO2balance)**

**Right image: specification of a India Mark 2 pump (Source: Red Cross<sup>2</sup>)**

	India Mark 2
Cylinder diameter (mm):	63.5
Maximum Stroke (mm):	125
Approx. discharge (75 watt input):	at 50 m head: 0.55 m <sup>3</sup> /hour,
	at 60 m head 0.45 m <sup>3</sup> /hour,
	at 70 m head: 0.4 m <sup>3</sup> /hour,
Pumping lift (m):	10-50
Water consumption (lpcd):	15-20
Max number of Users	400

The number of days each borehole credited for in this monitoring period was multiplied by the number of people using the borehole to give the total number of project technology days for that borehole. The individual project technology days for each borehole were totaled to give the total number of project technology days for this monitoring period. The 57 boreholes were rehabilitated between the 19<sup>th</sup> May 2019 to the 1<sup>st</sup> February 2020, which began crediting for this report on 1<sup>st</sup> September 2020; an additional 75 boreholes were rehabilitated between 17<sup>th</sup> April 2020 and 28<sup>th</sup> August 2020. The following table details pertinent information for each borehole in the project and groups them by VPA:

<sup>2</sup> <https://www.rural-water-supply.net/en/implementation/public-domain-handpumps/india-mark-ii>

BH ID	Borehole Name	District	Date of rehab	Start of MP	Pump Model	Total Users	Mode of use
<b>VPA 203 - GS7475</b>					<b>Start date for VPA: 19/05/2019</b>		
KON-01	Chief Compound water point	Kono	18/05/2019	19/05/2021	Kardia (K-2000)	526	Domestic
KON-02	Open Eye Water Point	Kono	18/05/2019	19/05/2021	Kardia (K-2000)	572	Domestic
KON-03	LCM School Field Borehole	Kono	18/05/2019	19/05/2021	Kardia (K-2000)	529	Domestic
KON-04	Yardu Road water point	Kono	19/05/2019	19/05/2021	Kardia (K-2000)	740	Domestic
KON-07	Mokoroma Compound water point	Kono	07/06/2019	19/05/2021	Kardia (K-2000)	474	Domestic
KON-24	KDEC School water point	Kono	27/07/2019	19/05/2021	India Mark 2	594	Domestic
KAI-01	Pa Amara Setiwa Compound Borehole	Kailahun	25/04/2020	19/05/2021	Kardia (K-2000)	528	Domestic
KAI-02	Kissy Kenema Section Borehole	Kailahun	25/04/2020	19/05/2021	Kardia (K-2000)	586	Domestic
KAI-03	Mdm. Moinya Kaikai Compound Borehole	Kailahun	25/04/2020	19/05/2021	Kardia (K-2000)	642	Domestic
KAI-04	Methodist Primary School Compound Borehole	Kailahun	08/05/2020	19/05/2021	Kardia (K-2000)	545	Domestic
KAI-05	Kongonanie Borehole	Kailahun	17/04/2020	19/05/2021	Kardia (K-2000)	486	Domestic
KAI-06	R. C. One School Compound Borehole	Kailahun	05/05/2020	19/05/2021	Kardia (K-2000)	528	Domestic
KAI-07	Paris Section Borehole	Kailahun	06/05/2020	19/05/2021	Kardia (K-2000)	500	Domestic
						<b>7,250</b>	
<b>VPA 204 - GS7476</b>					<b>Start date for VPA: 20/05/2019</b>		
KON-10	Tamba Foah Compound water point	Kono	19/05/2019	19/05/2021	Kardia (K-2000)	701	Domestic
KON-11	Camp Road Water point	Kono	07/06/2019	19/05/2021	Kardia (K-2000)	300	Domestic
KON-12	Masingbe Road Water point	Kono	07/06/2019	19/05/2021	Kardia (K-65)	592	Domestic
KON-13	Yormandu Road Water point	Kono	08/06/2019	19/05/2021	Kardia (K-2000)	600	Domestic
KON-14	Sedibay Compound Borehole	Kono	22/06/2019	19/05/2021	Kardia (K-65)	651	Domestic

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KON-15	Benduma Road Borehole	Kono	23/06/2019	19/05/2021	Kardia (K-2000)	501	Domestic
KAI-08	Kpanguwama Section Borehole	Kailahun	24/04/2020	19/05/2021	Kardia (K-65)	521	Domestic
KAI-09	Pastor John Charles Compound Borehole	Kailahun	24/04/2020	19/05/2021	Kardia (K-65)	538	Domestic
KAI-10	Nagbena Junction Borehole	Kailahun	22/04/2020	19/05/2021	Kardia (K-2000)	540	Domestic
KAI-11	Bongalo Section Borehole	Kailahun	25/04/2020	19/05/2021	Kardia (K-2000)	533	Domestic
KAI-12	Jewaru Section Borehole	Kailahun	30/04/2020	19/05/2021	Kardia (K-65)	497	Domestic
KAI-13	Pa Brima Salia Compound Borehole	Kailahun	20/04/2020	19/05/2021	Kardia (K-65)	489	Domestic
KAI-14	Sannohla Borehole	Kailahun	20/04/2020	19/05/2021	Kardia (K-65)	556	Domestic
						<b>7,019</b>	
<b>VPA 205 - GS 7477</b>				<b>Start date for VPA: 13/06/2019</b>			
KON-30	Kpetema Central Borehole	Kono	12/06/2019	19/05/2021	Kardia (K-2000)	736	Domestic
KON-09	Aiah Komba Compound water point	Kono	13/06/2019	19/05/2021	Kardia (K-2000)	605	Domestic
KEN-25	R.C School Compound Borehole	Kenema	15/06/2019	19/05/2021	India Mark 2	649	Domestic
KON-31	UMC School Piema Road Water point	Kono	17/06/2019	19/05/2021	India Mark 2	489	Domestic
KON-17	Ndomaina Compound Water point	Kono	20/06/2019	19/05/2021	India Mark 2	609	Domestic
KON-18	Yawara Compound Borehole	Kono	27/06/2019	19/05/2021	Kardia (K-65)	480	Domestic
KAI-15	Nyekehun Section Borehole	Kailahun	20/04/2020	19/05/2021	Kardia (K-65)	498	Domestic
KAI-16	Kalonma Community Borehole	Kailahun	22/04/2020	19/05/2021	India Mark 2	509	Domestic
KAI-17	One Mile Borehole	Kailahun	28/04/2020	19/05/2021	Kardia (K-65)	499	Domestic
KAI-18	James Kabba Compound Borehole	Kailahun	22/04/2020	19/05/2021	Kardia (K-65)	476	Domestic
KAI-19	Guabu Section Borehole	Kailahun	22/04/2020	19/05/2021	Kardia (K-2000)	473	Domestic
KAI-20	Kania Quarter 3 Borehole	Kailahun	20/05/2020	19/05/2021	Kardia (K-2000)	636	Domestic

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KAI-21	Golawoma Quarter Borehole	Kailahun	28/04/2020	19/05/2021	Kardia (K-2000)	448	Domestic
						<b>7,107</b>	
<b>VPA 206 - GS 7478</b>				<b>Start date for VPA: 28/06/2019</b>			
KON-22	Pa Nyuma Gborie compound Borehole	Kono	27/06/2019	19/05/2021	Kardia (K-2000)	675	Domestic
KON-28	Pump Sation Borehole	Kono	28/06/2019	19/05/2021	Kardia (K-2000)	744	Domestic
KON-32	Sheku Koroma compound Borehole	Kono	24/07/2019	19/05/2021	Kardia (K-65)	684	Domestic
KON-21	Kurankor Compound Borehole	Kono	25/07/2019	19/05/2021	Kardia (K-65)	671	Domestic
KEN-14	Abu Marrah Compound Borehole	Kenema	26/07/2019	19/05/2021	India Mark 2	596	Domestic
KAI-22	Mandingo Quarter Borehole	Kailahun	18/05/2020	19/05/2021	Kardia (K-65)	528	Domestic
KAI-23	Kosiala Borehole	Kailahun	28/04/2020	19/05/2021	Kardia (K-65)	541	Domestic
KAI-24	R.C. Boys School Compound Borehole	Kailahun	20/05/2020	19/05/2021	Kardia (K-2000)	510	Domestic
KAI-25	Barka Section Borehole	Kailahun	28/04/2020	19/05/2021	Kardia (K-2000)	538	Domestic
KAI-26	Golawoma Section Borehole	Kailahun	30/04/2020	19/05/2021	Kardia (K-65)	477	Domestic
KAI-27	Bockarie Pabai's Compound Borehole	Kailahun	30/04/2020	19/05/2021	Kardia (K-65)	535	Domestic
KAI-28	Nixon Hospital Borehole	Kailahun	18/05/2020	19/05/2021	India Mark 2	520	Domestic
						<b>7,019</b>	
<b>VPA 207 - GS7479</b>				<b>Start date for VPA: 29/07/2019</b>			
KON-23	KDEC School water point	Kono	28/07/2019	19/05/2021	India Mark 2	671	Domestic
KON-26	ABC Store water point	Kono	29/07/2019	19/05/2021	India Mark 2	679	Domestic
KON-20	Sahr Bobor Compound Borehole	Kono	30/07/2019	19/05/2021	Kardia (K-2000)	448	Domestic
KON-25	KDEC School water point	Kono	31/07/2019	19/05/2021	India Mark 2	688	Domestic
KEN-15	Chief Brima Foday Compound Borehole	Kenema	01/08/2019	19/05/2021	India Mark 2	511	Domestic
KON-19	Sumaila Koroma	Kono	02/08/2019	19/05/2021	Kardia (K-65)	425	Domestic

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	Compound Borehole						
KEN-26	Mdm. Iye Banya's Compound Borehole	Kenema	19/06/2020	19/05/2021	India Mark 2	401	Domestic
KEN-27	Koromba Section 2 Borehole	Kenema	17/06/2020	19/05/2021	India Mark 2	398	Domestic
KEN-28	Silla's Compound Borehole	Kenema	21/06/2020	19/05/2021	India Mark 2	476	Domestic
KEN-29	Chief Compound Borehole	Kenema	21/06/2020	19/05/2021	India Mark 2	492	Domestic
KEN-30	O.C Quarter's Borehole	Kenema	19/06/2020	19/05/2021	India Mark 2	423	Domestic
KEN-31	Pa Kennedy's Compound Borehole	Kenema	18/06/2020	19/05/2021	India Mark 2	428	Domestic
KEN-32	Mdm. Mamie Daniel Compound Borehole	Kenema	18/06/2020	19/05/2021	India Mark 2	415	Domestic
						<b>6,455</b>	
<b>VPA 208 - GS7480</b>					<b>Start date for VPA: 04/08/2019</b>		
KON-29	Saiama Central Borehole	Kono	03/08/2019	19/05/2021	Kardia (K-65)	750	Domestic
KON-05	Mdm Ballay Komba Compound Borehole	Kono	04/08/2019	19/05/2021	Kardia (K-2000)	769	Domestic
KON-16	New Sembehun Road Borehole	Kono	27/11/2019	19/05/2021	Kardia (K-65)	803	Domestic
KEN-01	Moisala Borehole	Kenema	22/11/2019	19/05/2021	India Mark 2	525	Domestic
KON-27	Johnny Compound Water Point	Kono	21/11/2019	19/05/2021	Kardia (K-2000)	543	Domestic
KEN-33	Serabu CHP Borehole	Kenema	20/06/2020	19/05/2021	India Mark 2	491	Domestic
KAI-29	Kai Tongie's Compound Borehole	Kailahun	09/06/2020	19/05/2021	Kardia (K-65)	518	Domestic
KAI-30	Sahr Kettor Compound Borehole	Kailahun	08/06/2020	19/05/2021	Kardia (K-2000)	433	Domestic
KAI-31	Sundufula Borehole	Kailahun	09/06/2020	19/05/2021	Kardia (K-65)	453	Domestic
KAI-32	R.C. School Compound Borehole	Kailahun	10/06/2020	19/05/2021	Kardia (K-2000)	419	Domestic
KAI-33	Kongorhun Road Borehole	Kailahun	10/06/2020	19/05/2021	Kardia (K-2000)	477	Domestic
KAI-34	Makor Central Borehole	Kailahun	11/06/2020	19/05/2021	Kardia (K-2000)	435	Domestic

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KAI-35	Assembly of God Church Compound Borehole	Kailahun	11/06/2020	19/05/2021	Kardia (K-2000)	489	Domestic
						<b>7,105</b>	
<b>VPA 209 - GS7481</b>				<b>Start date for VPA: 14/11/2019</b>			
KEN-10	Central Mosque Borehole	Kenema	18/11/2019	19/05/2021	India Mark 2	722	Domestic
KON-06	Masundu central Borehole	Kono	15/11/2019	19/05/2021	Kardia (K-65)	697	Domestic
KEN-13	One Mile Borehole	Kenema	19/11/2019	19/05/2021	India Mark 2	644	Domestic
KEN-11	Jimmy section borehole	Kenema	20/11/2019	19/05/2021	India Mark 2	597	Domestic
KON-08	Saardu Junction water point	Kono	13/11/2019	19/05/2021	Kardia (K-2000)	622	Domestic
KAI-36	Njagor Section Borehole	Kailahun	16/06/2020	19/05/2021	Kardia (K-2000)	506	Domestic
KAI-37	Motema Section Borehole	Kailahun	16/06/2020	19/05/2021	Kardia (K-2000)	466	Domestic
KAI-38	Sahr Bockarie Compound	Kailahun	08/06/2020	19/05/2021	Kardia (K-65)	430	Domestic
KAI-39	Foryola Section Borehole	Kailahun	15/06/2020	19/05/2021	Kardia (K-2000)	533	Domestic
KAI-40	Ahmadiyya Primary School Compound Borehole	Kailahun	15/06/2020	19/05/2021	Kardia (K-2000)	478	Domestic
KAI-41	Gietibu Section Borehole	Kailahun	14/06/2020	19/05/2021	Kardia (K-2000)	477	Domestic
KAI-42	Gbonortown Section Borehole	Kailahun	14/06/2020	19/05/2021	Kardia (K-2000)	486	Domestic
KAI-43	Belebu Park Borehole	Kailahun	14/06/2020	19/05/2021	Kardia (K-2000)	486	Domestic
						<b>7,144</b>	
<b>VPA 210 - GS7482</b>				<b>Start date for VPA: 14/11/2019</b>			
KEN-12	Karkor Road Borehole	Kenema	28/11/2019	19/05/2021	India Mark 2	583	Domestic
KEN-03	Ansumana Fofana Compound Borehole	Kenema	14/11/2019	19/05/2021	India Mark 2	571	Domestic
KEN-04	Madam Cecilia Koroma Compound Borehole	Kenema	13/11/2019	19/05/2021	India Mark 2	580	Domestic
KEN-07	Chief Compound Water Point	Kenema	15/11/2019	19/05/2021	India Mark 2	564	Domestic

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KEN-02	Samala Compound Borehole	Kenema	14/11/2019	19/05/2021	India Mark 2	536	Domestic
KEN-08	Koromba 1 Section borehole	Kenema	15/11/2019	19/05/2021	India Mark 2	527	Domestic
KAI-44	Kissy Town Market Borehole	Kailahun	12/06/2020	19/05/2021	Kardia (K-2000)	442	Domestic
KAI-45	Morpama Section Borehole	Kailahun	12/06/2020	19/05/2021	Kardia (K-2000)	425	Domestic
KAI-46	Tokpombu Borehole	Kailahun	13/06/2020	19/05/2021	Kardia (K-2000)	490	Domestic
KAI-47	Mofindor Road Borehole	Kailahun	13/06/2020	19/05/2021	Kardia (K-65)	345	Domestic
KON-33	Pa Simeon Compound Borehole	Kono	13/07/2020	19/05/2021	Kardia (K-2000)	587	Domestic
KON-34	Chief Compound Borehole	Kono	18/07/2020	19/05/2021	Kardia (K-65)	520	Domestic
KON-35	Mdm Sia Marie Compound Borehole	Kono	16/07/2020	19/05/2021	Kardia (K-65)	524	Domestic
KON-36	Sahr E.Bona Compound Borehole	Kono	12/07/2020	19/05/2021	Kardia (K-65)	422	Domestic
						<b>7,116</b>	
<b>VPA 211 - GS7483</b>				<b>Start date for VPA: 23/01/2020</b>			
KEN-18	Temne Town Borehole	Kenema	22/01/2020	19/05/2021	India Mark 2	635	Domestic
KEN-05	Abdul Bangura Compound Borehole	Kenema	22/01/2020	19/05/2021	India Mark 2	543	Domestic
KEN-17	Koroma sei Compound Borehole	Kenema	23/01/2020	19/05/2021	India Mark 2	527	Domestic
KEN-09	Kpanguwama Section Borehole	Kenema	24/01/2020	19/05/2021	India Mark 2	649	Domestic
KEN-21	Kuwahun borehole	Kenema	24/01/2020	19/05/2021	India Mark 2	805	Domestic
KEN-24	Kamboma section Borehole	Kenema	27/01/2020	19/05/2021	India Mark 2	613	Domestic
KON-37	Kai Moseray Compound Borehole	Kono	14/07/2020	19/05/2021	Kardia (K-2000)	487	Domestic
KON-38	Kongomadu Mosque Borehole	Kono	17/07/2020	19/05/2021	Kardia (K-2000)	589	Domestic
KON-39	Tamba Lamin Compound Borehole	Kono	16/07/2020	19/05/2021	Kardia (K-2000)	527	Domestic
KON-40	Central Mosque Borehole	Kono	17/07/2020	19/05/2021	Kardia (K-2000)	519	Domestic

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KON-41	Komba Fomba Compound Borehole	Kono	13/07/2020	19/05/2021	Kardia (K-2000)	482	Domestic
KON-42	Old Town Borehole	Kono	11/07/2020	19/05/2021	Kardia (K-65)	516	Domestic
KON-43	Seidu MCHP Borehole	Kono	18/07/2020	19/05/2021	Kardia (K-65)	544	Domestic
KON-44	Saffea Koroma Compound Borehole	Kono	11/07/2020	19/05/2021	Kardia (K-65)	495	Domestic
						<b>7,931</b>	
<b>VPA 212 - GS7484</b>				<b>Start date for VPA: 26/11/2019</b>			
KEN-16	Thomas Samai Compound Borehole	Kenema	28/01/2020	19/05/2021	India Mark 2	521	Domestic
KEN-23	SLMB School Compound Borehole	Kenema	29/01/2020	19/05/2021	India Mark 2	552	Domestic
KEN-19	Quarter 2 Borehole	Kenema	30/01/2020	19/05/2021	India Mark 2	645	Domestic
KEN-22	Mayalar Borehole	Kenema	31/01/2020	19/05/2021	India Mark 2	539	Domestic
KEN-20	Gassimu Harding Compound Borehole	Kenema	23/01/2020	19/05/2021	India Mark 2	527	Domestic
KEN-06	Nyagbebo Road Borehole	Kenema	25/11/2019	19/05/2021	India Mark 2	708	Domestic
KON-45	Nanfayie Road Borehole	Kono	12/07/2020	19/05/2021	Kardia (K-2000)	484	Domestic
KON-46	Seidu Road Borehole	Kono	12/07/2020	19/05/2021	Kardia (K-65)	489	Domestic
KAI-48	Bambawo Section Borehole	Kailahun	21/07/2020	19/05/2021	Kardia (K-2000)	512	Domestic
KAI-49	Chief Amara Compound Borehole/Kulula	Kailahun	21/07/2020	19/05/2021	Kardia (K-2000)	453	Domestic
KAI-50	Pa Ganawa Compound Borehole	Kailahun	22/07/2020	19/05/2021	Kardia (K-2000)	584	Domestic
KAI-51	Gbessay Juana Compound Borehole	Kailahun	20/07/2020	19/05/2021	Kardia (K-2000)	539	Domestic
KAI-52	Belebu Section Borehole	Kailahun	20/07/2020	19/05/2021	Kardia (K-65)	530	Domestic
KAI-53	Blama Quarter One Section Borehole	Kailahun	28/08/2020	19/05/2021	Kardia (K-2000)	502	Domestic
						<b>7,585</b>	

B.1.1. Forward Action Requests

>> The below table highlights the Forward Action Requests received:

Project Phase	GS Review	Date	FAR
2	Validation	Oct-20	<p># 1: Prior to 1st verification, the date of rehabilitation for all boreholes included in a VPA shall be cross-checked along with the GPS co-ordinates of each borehole.</p> <p># 2: PD should note that GS-TAC has determined parameter caps during an ongoing grievance as follows: Firewood consumption to boil 1 litre of water for 10 minutes will be capped at 0.400 kg for three stone firewood baseline stove scenarios. For other baseline fuels, projects will be assessed on case-by-case basis. AND For borehole projects, the number of users per borehole will be capped based on specifications from the borehole technology supplier/manufacturer. Depending on the outcomes of the grievance process, there is a potential for corrective measure, including but not limited to GS rule update and possible remedies for existing GS projects. Please see the grievance ToRs for more detail on how remedies may be proposed and applied.</p> <p>#3: CTFs shall be requested during CP renewal of the VPAs.</p> <p>#4: VPA-wide borehole grouping shall be checked during verification.</p>
1	Verification 1	Feb-21	<p># 1: PD to update their usage survey format to capture seasonality and supply a copy for SustainCERT approval prior to conducting the study.</p> <p># 2: PD to provide full transparency on maintenance programme roles and responsibilities. This should include: the process of recording and reporting all faults/breakdowns and when a borehole starts working again. It should also include a summary of all planned annual maintenance tasks and the downtime expected for these tasks. Future monitoring reports must have % total borehole downtime (and days) recorded transparently in Project Technology Days parameter box.</p>

**B.2. Post-Design Certification changes**

>>

B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

>>

No temporary deviations have been made during this monitoring period.

B.2.2. Corrections

>> No corrections to project information or fixed parameters have been applied.

### B.2.3. Changes to start date of crediting period

>> No changes have been made to the start date of the crediting period for this monitoring period.

### B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

>> No permanent changes have been made for this monitoring period.

### B.2.5. Changes to project design of approved project

>> As mentioned in the previous MR, a further 75 have been included in these VPAs, on top of the pre-existing 57 boreholes, for a total of 132 boreholes. The 75 are referred to in these documents as Phase 2, while the original 57 are referred to as Phase 1. The Phase 2 boreholes were rehabilitated between 17<sup>th</sup> April 2020 and 28<sup>th</sup> August 2020, and are all located in the Eastern Province (districts Kono, Kenema and Kailahun) alongside Phase 1. Thus both phases are entirely homogenous with each other, and are registered under the same baseline and LSC, hence the decision to include Phase 2 in this VPAs. Since they are homogenous, Phase 1 and Phase 2 were monitored together, using age-wise sampling (see Section D.4. for more details), and these are the data that are used in this report. Phase 2 boreholes have been bundled into the VPAs in an even spread, which can be seen in Section B.1. of this document, and in the 'Total PTDs' tab of the ER calculations spreadsheet.

## SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

>> The Project monitors the contribution towards 4 SDG indicators:

SDG 3: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

SDG 5: Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate.

SDG 6: By 2030, achieve universal and equitable access to safe and affordable drinking water for all.

SDG 13: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.

All surveys are administered by trained CO2balance staff and partner CODE-SL that are local to the area and conversant in the local dialects to ensure that the responses are consistent and not biased by any regional language barriers. Each participant is provided with a briefing on the purpose of the survey and is assured that no individual names are used in the analysis.

The results of the surveys are collated in excel spreadsheets and stored on a central server in an electronic format then is sent to the UK head office for data analysis. The documentation procedure devised ensures a minimum chance of original data being lost – all original copies of our project documentation are retained by CODE-SL in the Bo City office and are available scanned upon request of the CO2balance team.

In accordance with the Gold Standard methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption, the survey samples are randomly selected from the borehole user record. Each borehole user is assigned a unique random number which is then sorted in order from lowest to highest; the first nth HHs are selected for the survey. The size of the RSG is dependent on the methodological requirements and variance of the parameter being monitored to ensure the parameters measured satisfy 90/30 precision (90% confidence interval and 30% margin of error). The RSG is reselected for every monitoring period to ensure the selection remains random.

Below is a summary of the key information that has been collected and monitored as part of this project:

### **Borehole database**

The borehole installation/rehabilitation record includes the following information:

- Date of installation/rehabilitation
- GPS location of the borehole
- Model of the borehole
- Quantity of boreholes installed
- The total number of people obtaining their water from each borehole
- Mode of use: commercial/domestic

The total number of households using each borehole has been determined through the lists supplied by the community group and district officials. CODE-SL further conducts studies to screen and determine the exact number of people the rehabilitated boreholes. Using this method, the total number of people using each borehole has been fixed and hence a figure for person days can be calculated.

### **Ongoing Monitoring Studies**

The following ongoing monitoring studies were conducted; the results are given in the parameter boxes tables in Section 6.

- **Water consumption field test** (Equation parameters  $Q_p, y$  and  $Q_p, rawboil, y$ ) – The WCFT was conducted during February 2022 and sampled 40 households.
- **Quality of the treated water** - Water quality tests were conducted on all boreholes in the project area following rehabilitation and all were within levels considered acceptable for domestic human consumption as per the WHO guidelines. Testing took place quarterly for boreholes in the Kono, Kenema, and Kailahun Districts.
- **Usage Survey** – This survey was conducted during February 2022 and sampled the minimum number of 100 households.
- **Project Survey** – This survey was conducted during February 2022 and sampled the minimum number of 100 households.
- **Leakage assessment** - Sources of leakage detailed within the methodology relevant to this project have been reviewed.

Individual participants were selected from the borehole user data base using the random sampling process outlined in the monitoring plan. Sample sizes are in line with the Gold Standard requirements.

## Leakage Assessment

In line with the monitoring requirements, a leakage assessment is conducted biennially and has therefore been included in this report. The potential sources of leakage listed in the methodology have been investigated, and addressed below:

*a) The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project.*

In all cases the baseline technologies displaced are three stones; these have no market value and are not a product as such. There is nothing limiting the use of three stone cooking across the country (the technology is lowest rung on the energy ladder and the price is zero), which is why this cooking method is so widespread. In any case the primary purpose of these three rocks is for cooking so they will not be replaced/displaced in their entirety as a result of this project - which means they will not be reused outside the project boundary. This leakage source can therefore be discounted.

*b) The non-renewable biomass or fossil fuels saved under the project activity are used by non-project users who previously used lower emitting energy sources.*

There is no evidence to suggest significant (if any) use of renewable energy for purifying water in the project region as found in the Baseline Water Surveys. Renewable energy used for purifying water would likely be animal dung or crop residues which will be used due to ease of availability/proximity to the home rather than due to a shortage of wood fuel, therefore it is an independent factor. This leakage source can therefore be discounted.

*c) The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario.*

As most participants collect wood from within the project boundary, it is not expected that the NRB in other areas will be affected. There are currently no other CDM or VER projects in the project area.

*d) The project population compensates for loss of the space heating effect of inefficient technology by adopting some other form of heating or by retaining some use of inefficient technology.*

The space heating effect of boiling water for purification purposes will be minimal, as the predominant use of baseline technology is for cooking. Therefore, it is highly unlikely that another technology will be used for heating when users no longer boil water.

*e) By virtue of promotion and marketing of new technology with high efficiency, the project stimulates substitution within households who commonly used a technology with relatively lower emissions, in cases where such a trend is not eligible as an evolving baseline.*

This project is not marketing efficient technology; it is eliminating the need for a fuel-based technology to deliver pure water. Lower emission technology substitution within households is therefore not possible and this leakage source can therefore be discounted.

## SECTION D. DATA AND PARAMETERS

### D.1. Data and parameters fixed ex ante or at renewal of crediting period

>>

<b>Relevant SDG Indicator</b>	<p><b>SDG 3 (Good Health and Wellbeing) 3.9:</b> By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination</p> <p><b>3.9.1:</b> Mortality rate attributed to household and ambient air pollution.</p> <p><b>3.9.2:</b> Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services</p>
<b>Data/parameter:</b>	<b>P<sub>b,boil</sub></b>
Unit	Percentage

Description	Percentage of persons boiling water for purification in the baseline scenario
Source of data	Baseline study
Value(s) applied)	66%
Choice of data or measurement methods and procedures	-
Purpose of data	Calculating SDG 3 impact
Additional comments	

<b>Relevant SDG Indicator</b>	<p><b>SDG 3 (Good Health and Wellbeing) 3.9:</b> By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination</p> <p><b>3.9.2:</b> Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services</p>
<b>Data/parameter:</b>	Ib,y
Unit	Percentage
Description	Percentage of incidences of stomach related illnesses or water-borne diseases prior to project activity
Source of data	Baseline study
Value(s) applied)	88%
Choice of data or measurement methods and procedures	The percentage of incidences of stomach related illnesses or water-borne diseases is determined through the baseline project survey and refers to the number of respondents that suffer from stomach-related illness or water-borne diseases once every few months or more frequently
Purpose of data	Calculating SDG 3 impact
Additional comments	

<b>Relevant SDG Indicator</b>	<p><b>SDG 5 (Gender Equality) 5.4:</b> Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate.</p> <p><b>5.4.1:</b> Proportion of time spent on unpaid domestic and care work, by sex, age and location</p>
<b>Data/parameter:</b>	Tb,y
Unit	Minutes
Description	Time spent collecting water in the baseline scenario
Source of data	Baseline Survey
Value(s) applied)	73.8
Choice of data or measurement methods and procedures	-
Purpose of data	Calculating SDG 5 impact
Additional comments	

<b>Relevant SDG Indicator</b>	<p><b>SDG 6 (Clean Water and Sanitation) 6.1</b> By 2030, achieve universal and equitable access to safe and affordable drinking water for all.</p> <p><b>6.1.1:</b> Proportion of population using safely managed drinking water services</p> <p><b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.</p>
<b>Data/parameter:</b>	Xboil Non-Suppressed demand
Unit	Percentage
Description	Percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies like chlorine treatment techniques (if available) in the project boundary,
Source of data	Baseline study. Credible literature, studies, survey, reports, relevant to the project target area
Value(s) applied)	5%

Choice of data or measurement methods and procedures	Suppressed demand will be determined through a set of questions in the project survey that establish the method households use to purify their water, if any, and how they would choose to purify if they were not subject to monetary and access barriers. This is in line with the Gold Standard principles of suppressed demand outline in annex 2. A fixed suppressed demand baseline has been opted for.
Purpose of data	Calculate ERs
Additional comments	

<b>Relevant SDG Indicator</b>	<p><b>SDG 6 (Clean Water and Sanitation) 6.1</b> By 2030, achieve universal and equitable access to safe and affordable drinking water for all.</p> <p><b>6.1.1:</b> Proportion of population using safely managed drinking water services</p> <p><b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.</p>
<b>Data/parameter:</b>	Cj
Unit	Percentage
Description	Portion of users of project safe water supply who were already in baseline using a non- boiling safe water supply.
Source of data	Baseline study. Credible literature, studies, survey, reports, relevant to the project target area
Value(s) applied)	2%
Choice of data or measurement methods and procedures	The portion of safe water users is determined though the baseline project survey and refers to the number of users that already use safe water from water sources such as boreholes.
Purpose of data	Calculate ERs, SDG 3 & 6
Additional comments	

<b>Relevant SDG Indicator</b>	<p><b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.</p>
<b>Data/parameter:</b>	EF <sub>b,co2</sub>
Unit	tco <sub>2</sub> /TJ
Description	co <sub>2</sub> emission factor arising from use of fuels in baseline scenario
Source of data	IPCC default value

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Value(s) applied)	112
Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculate ERs
Additional comments	

<b>Relevant SDG Indicator</b>	<b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
<b>Data/parameter:</b>	EF <sub>b,non co2</sub>
Unit	tco <sub>2</sub> /TJ
Description	Non-co <sub>2</sub> emission factor arising from use of fuels in baseline scenario
Source of data	IPCC default value
Value(s) applied)	9.46
Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculate ERs
Additional comments	

<b>Relevant SDG Indicator</b>	<b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
<b>Data/parameter:</b>	EF <sub>p,co2</sub>
Unit	tco <sub>2</sub> /TJ
Description	co <sub>2</sub> emission factor arising from use of fuels in project scenario
Source of data	IPCC default value (same as baseline)
Value(s) applied)	112
Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculate ERs
Additional comments	

<b>Relevant SDG Indicator</b>	<b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
<b>Data/parameter:</b>	EFp,non co2
Unit	tco2/TJ
Description	Non-co2 emission factor arising from use of fuels in project scenario
Source of data	IPCC default value (same as baseline)
Value(s) applied)	9.46
Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculate ERs
Additional comments	

<b>Relevant SDG Indicator</b>	<b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
<b>Data/parameter:</b>	NCVb /NCVp
Unit	TJ/ton
Description	Net calorific value of the fuels used in the project
Source of data	IPCC default value
Value(s) applied)	0.0156
Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculate ERs
Additional comments	

<b>Relevant SDG Indicator</b>	<b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
<b>Data/parameter:</b>	f <sub>NRB,i,y</sub>
Unit	Fractional non-renewability
Description	Non-renewability status of woody biomass fuel in scenario i during year y
Source of data	CDM Default National Figure
Value(s) applied)	0.95

Choice of data or measurement methods and procedures	fNRB,i,y
Purpose of data	Calculate ERs
Additional comments	

<b>Relevant SDG Indicator</b>	<b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
<b>Data/parameter:</b>	$W_{b,y}$
Unit	T/litre
Description	Quantity of fuel that is used to treat 1 litre of water in the baseline scenario p during year y
Source of data	Baseline Water Boiling Test
Value(s) applied)	0.0004 (temporary cap)
Choice of data or measurement methods and procedures	The baseline water boiling test is used to determine the amount of wood used to purify 1 litre of water by boiling. This data is gathered according to: <i>Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1, Draft General Guidelines On Sampling And Surveys</i> ; EB37 Annex 27; and <i>Standard For Sampling And Surveys For CDM Project Activities and Programme of Activities (Version 02)</i> ; EB65 Annex 2
Purpose of data	Calculate ERs
Additional comments	

<b>Relevant SDG Indicator</b>	<b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
<b>Data/parameter:</b>	$W_{p,y}$
Unit	T/litre
Description	Quantity of fuel that is used to treat 1 litre of water in the project scenario p during year y
Source of data	Baseline Water Boiling Test
Value(s) applied)	0.0004 (temporary cap)
Choice of data or measurement methods and procedures	The baseline water boiling test is used to determine the amount of wood used to purify 1 litre of water by boiling. This data is gathered according to: <i>Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1, Draft General Guidelines On Sampling And Surveys</i> ; EB37 Annex 27; and <i>Standard For Sampling And Surveys For CDM Project Activities and Programme of Activities (Version 02)</i> ; EB65 Annex 2

Purpose of data	Calculate ERs
Additional comments	

## D.2. Data and parameters monitored

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<b>Relevant SDG Indicator</b>	<b>SDG 3 (Good Health and Wellbeing) 3.9:</b> By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination  <b>3.9.2:</b> Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services
<b>Data / Parameter</b>	Ip,y
Unit	Percentage
Description	Percentage of incidences of stomach related illnesses or water-borne diseases in project
Measured/calculated/default	Measured
Source of data	Project Survey
Value(s) of monitored parameter	26% (All VPAs)
Monitoring equipment	Project Survey
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data	Calculating SDG 3 impact
Additional comments:	

<b>Relevant SDG Indicator</b>	<p><b>SDG 5 (Gender Equality) 5.4:</b> Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate.</p> <p><b>5.4.1:</b> Proportion of time spent on unpaid domestic and care work, by sex, age and location</p>
<b>Data / Parameter</b>	Tp,y
Unit	Minutes
Description	Total time spent collecting water per household per day in project.
Measured/calculated/default	Measured
Source of data	Project Survey
Value(s) of monitored parameter	28.8 (All VPAs)
Monitoring equipment	Project Survey
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data	Calculating time saved by project.
Additional comments:	

<b>Relevant SDG Indicator</b>	<p><b>SDG 5 (Gender Equality) 5.4:</b> Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate.</p> <p><b>5.4.1:</b> Proportion of time spent on unpaid domestic and care work, by sex, age and location</p>
<b>Data / Parameter</b>	TRy
Unit	Percentage
Description	Total reduction time spent collecting water for project activity in year y (%)
Measured/calculated/default	Measured
Source of data	Project Survey

TEMPLATE-

Value(s) of monitored parameter	61% (All VPAs)
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Calculate the average amount of time spent collecting water in the project scenario and compare to the pre-project scenario
QA/QC procedures:	-
Purpose of data	To quantify whether the project has contributed to a reduction in the amount of time spent collecting water compared to the pre-project scenario
Additional comments:	

<b>Relevant SDG Indicator</b>	<p><b>SDG 5 (Gender Equality) 5.4:</b> Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate.</p> <p><b>5.4.1:</b> Proportion of time spent on unpaid domestic and care work, by sex, age and location</p>
<b>Data / Parameter</b>	Usage of time saved on water collection
Unit	Percentage
Description	Uses of time saved which was previously spent on water collection
Measured/calculated/default	Measured
Source of data	Project Survey
Value(s) of monitored parameter	<ol style="list-style-type: none"> <li>1. (Unpaid) Domestic work (includes cooking and caring for family members): 63%</li> <li>2. Income generating activities: 28%</li> <li>3. Religious activities: 15%</li> <li>4. Social and leisure activities: 2%</li> <li>5. Voluntary activities: 0%</li> <li>6. Education and training: 28%</li> <li>7. Other (Specify): 0%</li> </ol>
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Ask users how time saved on water collection in the project scenario, as opposed to the baseline scenario, is now being used.
QA/QC procedures:	-

TEMPLATE-

Purpose of data	To quantify how time which was previously spent on water collection is now being used
Additional comments:	

<b>Relevant SDG Indicator/Safeguarding Principle</b>	<b>SDG 6 (Clean Water and Sanitation) 6.1</b> By 2030, achieve universal and equitable access to safe and affordable drinking water for all.
<b>Data / Parameter</b>	Py
Unit	Number
Description	Number of persons having access to safe water in the project activity
Measured/calculated/default	Calculated
Source of data	User lists, set at the time of the rehabilitation.
Value(s) of monitored parameter	GS 7475: 3,900 (7,205) GS 7476: 3,900 (7,120) GS 7477: 3,900 (7,183) GS 7478: 3,600 (7,200) GS 7479: 3,900 (6,437) GS 7480: 3,900 (7,156) GS 7481: 3,900 (7,328) GS 7482: 4,200 (7,215) GS 7483: 4,200 (8,039) GS 7484: 4,200 (7,711) Total: 39,600 (72,601)
Monitoring equipment	User lists
Measuring/reading/recording frequency:	Recorded Continuously
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculating access to safe water

Additional comments:	<p>SDG 3: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination</p> <p>SDG 6: By 2030, achieve universal and equitable access to safe and affordable drinking water for all</p> <p>Temporary cap of 300 Users per borehole</p>
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<b>Relevant SDG Indicator/Safeguarding Principle</b>	<b>SDG 6 (Clean Water and Sanitation) 6.1</b> By 2030, achieve universal and equitable access to safe and affordable drinking water for all.
<b>Data / Parameter</b>	P <sub>access</sub>
Unit	Number
Description	Number of additional persons having access to safe water in the project activity compared to the baseline scenario.
Measured/calculated/default	Measured
Source of data	Household lists; Usage Survey
Value(s) of monitored parameter	<p>GS7475: 3,631</p> <p>GS7476: 3,631</p> <p>GS7477: 3,631</p> <p>GS7478: 3,352</p> <p>GS7479: 3,631</p> <p>GS7480: 3,631</p> <p>GS7481: 3,631</p> <p>GS7482: 3,910</p> <p>GS7483: 3,910</p> <p>GS7484: 3,910</p> <p>Total: 36,868</p>
Monitoring equipment	Household lists; Usage Survey
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	See section E.
QA/QC procedures:	-
Purpose of data:	To calculate the additional number of persons having access to safe water in the project activity compared to the baseline scenario
Additional comments:	

<b>Relevant SDG Indicator</b>	<p><b>SDG 6 (Clean Water and Sanitation) 6.1</b> By 2030, achieve universal and equitable access to safe and affordable drinking water for all.</p> <p><b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.</p>
<b>Data/parameter:</b>	Quality of Treated Water
Unit	Parameters as per national standards
Description	Laboratory Tests
Measured/calculated/default	Measured
Source of data	Water quality tests
Value(s) of monitored parameter	Pass - The Kenema water quality laboratory, part of the ministry of water resources government department has certified each water supply in line with the WHO guidelines.
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	
QA/QC procedures:	
Purpose of data:	Ensure water is safe for human consumption without treatment using the project technology
Additional comments:	

<b>Relevant SDG Indicator</b>	<p><b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.</p>
<b>Data/parameter:</b>	Np,y
Unit	Project Technology Days
Description	Number of persons consuming water supplied by project scenario p through year y
Measured/calculated/default	Measured
Source of data	Borehole Project Database

Value(s) of monitored parameter	GS7475: 1,317,000 (2,436,625) – 7% GS7476: 1,340,100 (2,459,478) – 6% GS7477: 1,354,500 (2,489,525) – 5% GS7478: 1,258,800 (2,526,054) – 4% GS7479: 1,086,600 (1,797,224) – 24% GS7480: 1,340,700 (2,486,352) – 6% GS7481: 1,218,600 (2,268,356) – 14% GS7482: 1,390,200 (2,407,198) – 9% GS7483: 1,437,000 (2,714,365) – 6% GS7484: 1,389,600 (2,537,652) – 9%  Total: 13,133,100 (24,122,829) – 9%
Monitoring equipment	Borehole Project Database
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Borehole users * Total crediting days
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	95% cap applied

<b>Relevant SDG Indicator</b>	<b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
<b>Data/parameter:</b>	Up,y
Unit	Percentage
Description	Usage rate in project scenario p through year y
Measured/calculated/default	Measured
Source of data	Annual Usage Survey
Value(s) of monitored parameter	81.73%
Monitoring equipment	The usage survey has been carried out by staff trained by CO2balance and local in- country partner CODE-SL to meet the specific requirements of the methodology. All data presented in Excel is subject to checking and cross referencing of a sample of the raw data by the project developers
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	

<b>Relevant SDG Indicator</b>	<b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
<b>Data/parameter:</b>	$Q_{p,y}$
Unit	Litres per person per day
Description	Quantity of safe water supplied in the project scenario p during the year y using the zero or low emissions clean water supply technology
Measured/calculated/default	Measured
Source of data	Water Consumption Field Test (WCFT)
Value(s) of monitored parameter	7.5 (capped) 11.99 (uncapped) – this value has not been used during the calculations
Monitoring equipment	-
Measuring/reading/recording frequency:	Biennial
Calculation method (if applicable):	Method used similar to Kitchen Performance Test in which the volume of water consumed in each household is averaged over 3 days. The WCFT is carried out by staff trained by CO2balance and local in- country partner CODE-SL to meet the specific requirements of the methodology. All data presented in Excel is subject to checking and cross referencing of a sample of the raw data by the project developers.
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	

<b>Relevant SDG Indicator</b>	<b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
<b>Data/parameter:</b>	$Q_{p,cleanboil,y}$
Unit	Litres per person per day
Description	Quantity of safe water boiled in the project scenario p during the year y using the zero or low emissions clean water supply technology
Measured/calculated/default	Measured
Source of data	WCFT
Value(s) of monitored parameter	0

Monitoring equipment	-
Measuring/reading/recording frequency:	Biennial
Calculation method (if applicable):	Method used similar to Kitchen Performance Test in which the volume of water consumed in each household is averaged over 3 days. The WCFT has been carried out by staff trained by CO2balance and local in-country partner FAPDR to meet the specific requirements of the methodology. All data presented in excel is subject to checking and cross referencing of a sample of the raw data by project developers.
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	

<b>Relevant SDG Indicator</b>	<b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
<b>Data/parameter:</b>	$Q_{p,rawboil,y}$
Unit	Litres per person per day
Description	The raw of unsafe water that is still boiled after installation of the water treatment technology
Measured/calculated/default	Measured
Source of data	WCFT
Value(s) of monitored parameter	0
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Method used similar to Kitchen Performance Test in which the volume of water consumed in each household is averaged over 3 days. The WCFT has been carried out by staff trained by CO2balance and local in-country partner FAPDR to meet the specific requirements of the methodology. All data presented in excel is subject to checking and cross referencing of a sample of the raw data by project developers.
QA/QC procedures:	
Purpose of data:	Calculate ERs
Additional comments:	

<b>Relevant SDG Indicator</b>	<b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
<b>Data/parameter:</b>	LEp,y
Unit	tCO2e per year
Description	Leakage in project scenario p during year y
Measured/calculated/default	Measured
Source of data	Baseline and monitoring surveys
Value(s) of monitored parameter	0
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	

<b>Relevant SDG Indicator</b>	<b>SDG 13 (Climate Action), 13B:</b> Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
<b>Data/parameter:</b>	Failure Days,y
Unit	Number
Description	Number of days a particular borehole was non-functioning during year y
Source of data	Borehole visits, communications from WRC
Value(s) applied	4,193
Measurement methods and procedures	The period in which a particular boreholes is considered to be non-functioning (as determined by maintenance visits) or not providing safe water (as determined by Water Quality Testing)
Monitoring frequency	Ongoing
QA/QC procedures	-
Purpose of data	Calculating ERs

Additional comment	Re-functionality of boreholes will be evidenced by signed RCF
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### D.3. Comparison of monitored parameters with last monitoring period

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
Ip,y	26% (all VPAs)	15% (all VPAs)
Tp,y	28.8 (all VPAs)	27.2 (all VPAs)
TRy	61% (all VPAs)	63.1% (all VPAs)
Usage of time saved on water collection	1. (Unpaid) Domestic work (includes cooking and caring for family members): 63% 2. Income generating activities: 28% 3. Religious activities: 15% 4. Social and leisure activities: 2% 5. Voluntary activities: 0% 6. Education and training: 28% 7. Other (Specify): 0% (all VPAs)	1. (Unpaid) Domestic work (includes cooking and caring for family members): 27% 2. Income generating activities: 42% 3. Religious activities: 3% 4. Social and leisure activities: 15% 5. Voluntary activities: 2% 6. Education and training: 10% 7. Other (Specify): 0% (all VPAs)
Py	GS 7475: 3,900	GS 7475: 3,900
	GS 7476: 3,900	GS 7476: 3,900
	GS 7477: 3,900	GS 7477: 3,900
	GS 7478: 3,600	GS 7478: 3,600
	GS 7479: 3,900	GS 7479: 3,900
	GS 7480: 3,900	GS 7480: 3,900
	GS 7481: 3,900	GS 7481: 3,900
	GS 7482: 4,200	GS 7482: 4,200
	GS 7483: 4,200	GS 7483: 4,200
	GS 7484: 4,200	GS 7484: 4,200
	Total: 39,600	Total: 39,600
P <sub>access</sub>	GS 7475: 3,631	GS 7475: 3,631
	GS 7476: 3,631	GS 7476: 3,631
	GS 7477: 3,631	GS 7477: 3,631
	GS 7478: 3,352	GS 7478: 3,352

	GS 7479: 3,631	GS 7479: 3,631
	GS 7480: 3,631	GS 7480: 3,631
	GS 7481: 3,631	GS 7481: 3,631
	GS 7482: 3,910	GS 7482: 3,910
	GS 7483: 3,910	GS 7483: 3,910
	GS 7484: 3,910	GS 7484: 3,910
	Total: 36,868	Total: 36,868
Quality of Treated Water	Pass (all VPAs)	Pass (all VPAs)
		GS 7475: 1,271,100
		GS 7476: 1,281,900
		GS 7477: 1,273,800
	GS7475: 1,317,000	GS 7478: 1,175,100
	GS7476: 1,340,100	GS 7479: 1,163,400
	GS7477: 1,354,500	GS 7480: 1,204,500
	GS7478: 1,258,800	GS 7481: 1,197,300
Np,y	GS7479: 1,086,600	GS 7482: 1,239,900
	GS7480: 1,340,700	GS 7483: 1,201,500
	GS7481: 1,218,600	GS 7484: 1,180,500
	GS7482: 1,390,200	
	GS7483: 1,437,000	
	GS7484: 1,389,600	
		Total: 12,189,000
Up,y	81.73% (all VPAs)	93.98% (all VPAs)
Qp,y	7.5 (all VPAs)	7.5 (all VPAs)
Qp,cleanboil,y	0 (all VPAs)	0 (all VPAs)
Qp,rawboil,y	0 (all VPAs)	0 (all VPAs)
LEp,y	0 (all VPAs)	0 (all VPAs)
Failure Days,y	4,403 (all VPAs)	0 (all VPAs)

#### D.4. Implementation of sampling plan

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The project proponent has elected to cross-sample technologies across all its homogenous borehole VPAs located within Kono, Kenema, and Kailahun districts. The samples for the surveys analysed below are randomly selected from the borehole information databases using the RSG procedure previously explained in line with the minimum sample size requirements as defined by the methodology, and cover VPA, borehole and household levels. The random sampling procedure is as follows. First

boreholes across Phase 1 and Phase 2 were assigned to age groups 2 and 3 respectively based on the time of rehabilitation. Following 90/30 precision, achieved using Raosoft Sample Size Calculator, it was found that 7 of the 57 boreholes in age group 2 and 7 of the 75 boreholes in age group 3 would need to be selected for inclusion in the surveys. These 14 boreholes were selected by generating a random list of numbers on the Research Randomizer online resource, separated by age group. An aggregate list was then generated of the borehole users in the 14 boreholes, and these were ordered according to a new random list of numbers, again generated using Research Randomizer. The aggregate list was then reordered according to random number and the first 78 from Age Group 2 and 42 from Age Group 3 (for a total of 120 users) selected for the Project Survey and Usage Survey (a selection of 100, with an extra 20 as buffer). The usage survey was conducted between 09/02/2022 and 21/02/2022. The project survey was conducted between 09/02/2022 and 21/02/2022. The WCFT was conducted between 16/02/2022 and 22/02/2022 and is conducted biennially.

A total of 120 users were successfully surveyed from random sample generated across the 14 boreholes indicated. The surveys have been conducted to ensure that they are within the end date of the respective monitoring periods for the VPAs.

## SECTION E. CALCULATION OF SDG IMPACTS

### E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

>>

#### SDG 3 (Good Health and Wellbeing)

$I_{b,y}$  Percentage of incidences of stomach related illnesses or water-borne diseases prior to project activity (%)

To establish  $I_{b,y}$ , the Baseline Survey asks the following:

17	Do you or your family ever suffer from stomach related illnesses/water-borne diseases and how often does this occur?	1. Never
		2. Once every few months
		3. Once per month
		4. Several times per month
		5. Weekly
		6. Everyday

$I_{b,y}$  (all VPAs) = 88%

#### SDG 5 (Gender Equality)

By ensuring that there is a safe water source at the centre of communities, the projects reduce the *time poverty* of women, because the time burden of collecting water, which falls disproportionately on women, is reduced. As the safe water sources are located centrally within communities, closer to public institutions and villages, the distance travelled to collect water is reduced, reducing the time per trip spent collecting water. In addition, as the water sources is maintained, they provide a reliable water supply, ensuring that water needs for cooking, drinking, and food preparation can be met by one central water source, so the time spent collecting water is minimised. The average % decrease per household in time spent collecting water is taken as a proxy contribution towards the SDG target.

$T_{b,y}$  Time spent collecting water per household per day prior to project (minutes)

$T_{b,y}$  (all VPAs) = 73.8

### SDG 6 (Clean Water and Sanitation)

The outcome for SDG 6 is quantified as the additional number of persons having access to safe water in the project activity compared to the baseline scenario ( $P_{\text{access}}$ ). The number of persons using each borehole is determined in the sensitization process during the rehabilitation. The percentage of users who were already consuming safe water in the baseline without boiling it ( $C_j$ ) is determined through the baseline survey.

$C_j$  Expressed as a percentage, the portion of users of the project technology  $j$  who in the baseline were already consuming safe water without boiling it.

$$C_j \text{ (all VPAs)} = 2\%$$

### SDG 13 (Climate Action)

CO2 emission reductions are the indicator to demonstrate that the project has raised capacity for effective climate change-related planning and management. This outcome is measured using the emission reduction calculations.

Baseline Emissions

$$BE_{b,y} = B_{b,y} * ((f_{NRB,b,y} * EF_{b,fuel,CO2}) + EF_{b,fuel,nonCO2}) * NCV_{b,fuel}$$

Where:

$$B_{b,y} = N_{p,y} * P_{b,y}$$

Where:

$N_{p,y}$  Project technology-days in the project database for project scenario  $p$  through year  $y$

$P_{b,y}$  Specific fuel consumption for an individual technology in baseline scenario  $b$  during year  $y$  converted to tons/day

$$N_{p,y} \text{ (for GS7475)} = 1,251,150$$

$$P_{b,y} \text{ (for GS7475)} = 0.00294$$

### E.2. Calculation of project value or estimation of project situation of each SDG Impact

>>

### SDG 3 (Good Health and Wellbeing)

$I_{p,y}$  Percentage of incidences of stomach related illnesses or water-borne diseases during project activity (%)

The project survey asks the following questions in order to establish  $I_{p,y}$ :

24	Do you or your family ever suffer from stomach related illnesses/water-borne diseases and how often does this occur?	1. Never
		2. Once every few months
		3. Once per month
		4. Several times per month
		5. Weekly
		6. Everyday

$I_{p,y}$  (all VPAs) = 26%

**SDG 5 (Gender Equality)**

$T_{p,y}$  Time spent collecting water per household per day in project (minutes)

The project survey asks the following questions in order to establish  $T_{p,y}$ ,  $Trips_p$  and to show what use is made of the time used.

37	Who usually goes to this source to collect water for your household?	1. Male Adult	2. Female Adult
		3. Male Child	4. Female Child
38	How much time does a trip to and from the borehole take?	<i>Please specify</i>	
39	How many trips are made per day to the borehole?	<i>Please specify</i>	
40	Has the borehole project saved you time?	1. Yes	2. No (skip to question 44)
41	In which of these activities has the borehole project saved you the most time?	1. Less distance to walk to the water source	2. Less time waiting at the water source
		3. Less time spent	4. Less time spent collecting

		boiling/purifying water	wood to boil water
		5. Other (Specify)	
42	How much time do you think the borehole project has saved you on average per day?	1. 0-30min	2. 31-60min
		3. 1-2hrs	4. 2-3hrs
		5. 3-4hrs	6. >4hrs
43	What do you do with the time saved from the project? <i>Select all that apply</i>	1. (Unpaid) Domestic work (includes cooking and caring for family members)	2. Income generating activities
		3. Religious activities	4. Social and leisure activities
		5. Voluntary activities	6. Education and training
		7. Other (Specify)	

$$T_{p,y} \text{ (all VPAs)} = 28.8$$

### SDG 6 (Clean Water and Sanitation)

$P_y$  Number of persons having access to safe water in the project activity.

$X_{boil}$  Percentage of premises that would have used other non-GHG emitting technologies like chlorine treatment techniques, if available, in the absence of the project activity.

$$P_y = 39,600$$

$$X_{boil} \text{ (all VPAs)} = 5\%$$

### SDG 13 (Climate Action)

$$PE_{p,y} = B_{p,y} * ((f_{NRB,p,y} * EF_{p,fuel,CO2}) + EF_{p,fuel,nonCO2}) * NCV_{p,fuel}$$

Where:

$$B_{p,y} = (1 - C_j) * N_{p,y} * W_{b,y} * (Q_{p,rawboil,y} + Q_{p,cleanboil,y})$$

Where:

$N_{p,y}$	Number of person.days consuming water supplied by project scenario p through year y
$C_j$	Expressed as a percentage, this is the portion of users of the project technology j or who in the baseline were already consuming safe water without boiling it
$B_{p,y}$	Quantity of fuel consumed in project scenario p during the year y in tons
$Q_{p,rawboil,y}$	Quantity of raw water boiled in the project scenario p per person per day
$Q_{p,cleanboil,y}$	Quantity of safe water boiled in the project scenario p per person per day
$W_{p,y}$	Quantity of wood fuel or fossil fuel in tons required to treat 1 litre of water using technologies representative of the project scenario p during project year y
$N_{p,y}$ (GS7475)	= 1,251,150
$C_j$ (all VPAs)	= 2%
$B_{p,y}$ (all VPAs)	= 0
$Q_{p,rawboil,y}$ (all VPAs)	= 0
$Q_{p,cleanboil,y}$ (all VPAs)	= 0
$W_{p,y}$ (all VPAs)	= 0.0004

### E.3. Calculation of leakage

>> In line with the monitoring requirements, a leakage assessment is conducted biennially and has therefore been included in this report. The potential sources of leakage listed in the methodology have been investigated, and addressed below:

*a) The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project.*

In all cases the baseline technologies displaced are three stones; these have no market value and are not a product as such. There is nothing limiting the use of three stone cooking across the country (the technology is lowest rung on the energy ladder and the price is zero), which is why this cooking method is so widespread. In any case the primary purpose of these three rocks is for cooking so they will not be replaced/displaced in their entirety as a result of this project - which means they will not be reused outside the project boundary. This leakage source can therefore be discounted.

*b) The non-renewable biomass or fossil fuels saved under the project activity are used by non-project users who previously used lower emitting energy sources.*

There is no evidence to suggest significant (if any) use of renewable energy for purifying water in the project region as found in the Baseline Water Surveys. Renewable energy used for purifying water would likely be animal dung or crop residues which will be used due to ease of availability/proximity to the home rather than due to a shortage of wood fuel, therefore it is an independent factor. This leakage source can therefore be discounted.

*c) The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario.*

As most participants collect wood from within the project boundary, it is not expected that the NRB in other areas will be affected. There are currently no other relevant CDM or VER projects in the project area, according to the CDM Project search and Verra Registry.

*d) The project population compensates for loss of the space heating effect of inefficient technology by adopting some other form of heating or by retaining some use of inefficient technology.*

The space heating effect of boiling water for purification purposes will be minimal, as the predominant use of baseline technology is for cooking. Therefore, it is highly unlikely that another technology will be used for heating when users no longer boil water.

e) By virtue of promotion and marketing of new technology with high efficiency, the project stimulates substitution within households who commonly used a technology with relatively lower emissions, in cases where such a trend is not eligible as an evolving baseline.

This project is not marketing efficient technology; it is eliminating the need for a fuel-based technology to deliver pure water. Lower emission technology substitution within households is therefore not possible and this leakage source can therefore be discounted.

#### E.4. Calculation of net benefits or direct calculation for each SDG Impact

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
		Baseline emission estimate for each VPA (BE <sub>b,y</sub> ):	Project emission estimate for each VPA (PE <sub>p,y</sub> ):	Emission reduction (ER <sub>y</sub> ) for each VPA (includes usage rate and leakage reductions):
13	Emissions Reductions	GS 7475: 6,648 tCO <sub>2e</sub>	GS 7475: 0 tCO <sub>2e</sub>	GS 7475: 5,161 tCO <sub>2e</sub>
		GS 7476: 6,765 tCO <sub>2e</sub>	GS 7476: 0 tCO <sub>2e</sub>	GS 7476: 5,252 tCO <sub>2e</sub>
		GS 7477: 6,838 tCO <sub>2e</sub>	GS 7477: 0 tCO <sub>2e</sub>	GS 7477: 5,308 tCO <sub>2e</sub>
		GS 7478: 6,355 tCO <sub>2e</sub>	GS 7478: 0 tCO <sub>2e</sub>	GS 7478: 4,933 tCO <sub>2e</sub>
		GS 7479: 5,485 tCO <sub>2e</sub>	GS 7479: 0 tCO <sub>2e</sub>	GS 7479: 4,258 tCO <sub>2e</sub>
		GS 7480: 6,768 tCO <sub>2e</sub>	GS 7480: 0 tCO <sub>2e</sub>	GS 7480: 5,254 tCO <sub>2e</sub>
		GS 7481: 6,152 tCO <sub>2e</sub>	GS 7481: 0 tCO <sub>2e</sub>	GS 7481: 4,775 tCO <sub>2e</sub>
		GS 7482: 7,018 tCO <sub>2e</sub>	GS 7482: 0 tCO <sub>2e</sub>	GS 7482: 5,448 tCO <sub>2e</sub>
		GS 7483: 7,254 tCO <sub>2e</sub>	GS 7483: 0 tCO <sub>2e</sub>	GS 7483: 5,631 tCO <sub>2e</sub>
		GS 7484: 7,015 tCO <sub>2e</sub>	GS 7484: 0 tCO <sub>2e</sub>	GS 7484: 5,445 tCO <sub>2e</sub>
		<b>Total: 66,298 tCO<sub>2e</sub></b>	<b>Total: 0 tCO<sub>2e</sub></b>	<b>Total: 51,465 tCO<sub>2e</sub></b>
3	Reduction in incidences of stomach related illnesses or water-borne diseases	<b>88%</b> of households who suffer from stomach related or water-borne illnesses at least once every few months	<b>26%</b> of households who suffer from stomach related or water-borne illnesses at least once every few months	<b>70%</b> reduction in the percentage of households who suffer from stomach related or water-borne illnesses at least once every few months

5	Reduction in time spent collecting water	<b>73.8</b> minutes spent collecting water and fuel per household per day in the baseline for all VPAs	<b>28.8</b> minutes spent collecting water and fuel per household per day in the baseline for all VPAs	<b>61%</b> reduction in time spent collecting water and firewood per household per day for all VPAs
		People consuming safe water prior to project: GS 7475: 269 GS 7476: 269 GS 7477: 269	People consuming safe water during project: GS 7475: 3,900 GS 7476: 3,900 GS 7477: 3,900	Additional people consuming safe water (P <sub>access</sub> ): GS 7475: 3,631 GS 7476: 3,631 GS 7477: 3,631
6	Additional people gaining access to safe water	GS 7478: 248	GS 7478: 3,600	GS 7478: 3,352
		GS 7479: 269	GS 7479: 3,900	GS 7479: 3,631
		GS 7480: 269	GS 7480: 3,900	GS 7480: 3,631
		GS 7481: 269	GS 7481: 3,900	GS 7481: 3,631
		GS 7482: 290	GS 7482: 4,200	GS 7482: 3,910
		GS 7483: 290	GS 7483: 4,200	GS 7483: 3,910
		GS 7484: 290	GS 7484: 4,200	GS 7484: 3,910
		<b>Total: 2,732</b>	<b>Total: 39,600</b>	<b>Total: 36,868</b>

### SDG 3 (Good Health and Wellbeing)

$$IR_y \text{ (all VPAs)} = 70\% = (0.88-0.26)/0.88*100$$

$$IR_y = (I_{b,y} - I_{p,y})/ I_{b,y}*100$$

Where:

**IR<sub>y</sub>** Total reduction in incidences of stomach related illnesses or water-borne diseases in the project activity compared to the baseline scenario in year y (%)

**I<sub>p,y</sub>** Persons who suffer from stomach related illnesses/water-borne diseases in project (%)

**I<sub>b,y</sub>** Persons who suffer from stomach related illnesses/water-borne diseases prior to project (%)

### SDG 5 (Gender Equality)

$$TR_y \text{ (all VPAs)} = 61\% = (73.8-28.8)/73.8 * 100$$

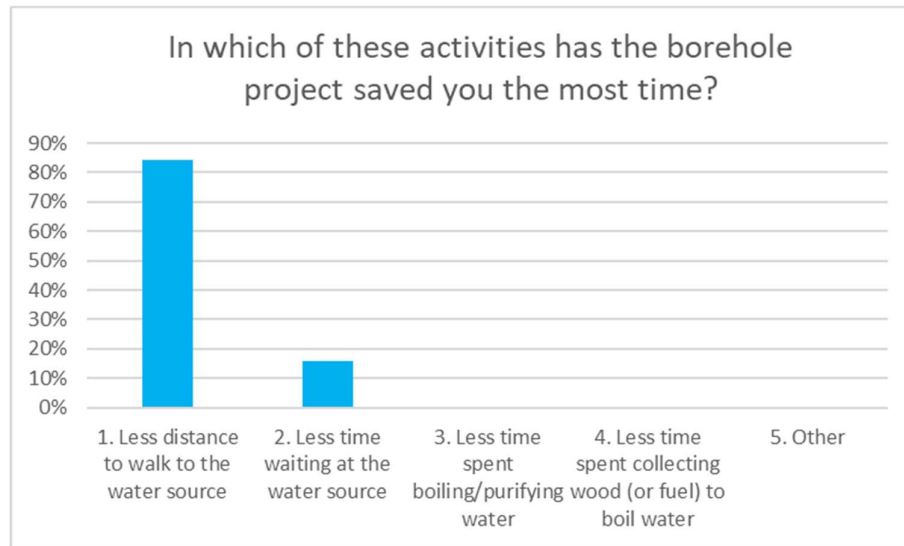
$$TR_y = (T_{b,y} - T_{p,y})/ T_{b,y} * 100$$

Where:

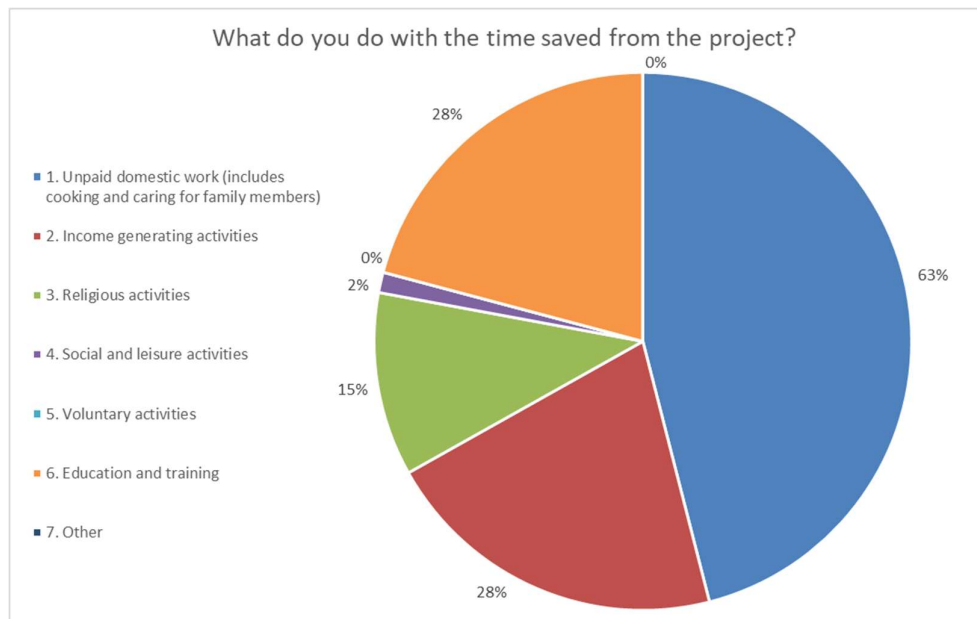
**TEMPLATE-**

- TR<sub>y</sub> Total reduction time spent collecting water for project activity in year y (%)
- T<sub>b,y</sub> Time spent collecting water per household per day prior to project (minutes)
- T<sub>p,y</sub> Time spent collecting water per household per day in project (minutes)

The project has saved households 28.8 minutes per day and for all households has reduced the distance needed to the water source (100%).



The 61% reduction in time spent collecting and treating water is used in the following ways:



### SDG 6 (Clean Water and Sanitation)

$$P_{\text{access}} \text{ (for GS7475)} = 3,631 = 3,900 * (1 - 0.02) * (1 - 0.05)$$

$$P_{\text{access}} = P_y * (1 - C_j) * (1 - X_{\text{boil}})$$

Where:

$P_{\text{access}}$  Number of additional persons having access to safe water in the project activity compared to the baseline scenario.

$P_y$  Number of persons having access to safe water in the project activity.

$C_j$  Expressed as a percentage, the portion of users of the project technology  $j$  who in the baseline were already consuming safe water without boiling it.

$X_{\text{boil}}$  Percentage of premises that would have used other non-GHG emitting technologies like chlorine treatment techniques, if available, in the absence of the project activity.

GS ID	$P_{\text{access}}$	$P_y$
GS 7475	3,631	3,900
GS 7476	3,631	3,900
GS 7477	3,631	3,900
GS 7478	3,352	3,600
GS 7479	3,631	3,900
GS 7480	3,631	3,900
GS 7481	3,631	3,900
GS 7482	3,910	4,200
GS 7483	3,910	4,200
GS 7484	3,910	4,200
<b>Total</b>	<b>36,868</b>	<b>39,600</b>

**SDG 13 (Climate Action)**

In MP3/2 the project achieved a total capped ERs of 51,986 tCO<sub>2</sub>e. Below is a summary of the ERs by VPA:

GS ID	Uncapped ERs	Capped ERs Total
GS 7475	15,540	5,161
GS 7476	15,685	5,252
GS 7477	15,877	5,308
GS 7478	16,109	4,933
GS 7479	11,469	4,258
GS 7480	15,856	5,254
GS 7481	14,471	4,775
GS 7482	15,353	5,448
GS 7483	17,312	5,631
GS 7484	16,185	5,445
<b>Total</b>	<b>153,857</b>	<b>51,465</b>

### E.5. Comparison of actual SDG Impacts with estimates in approved PDD

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values <sup>3</sup> achieved during this monitoring period
	Ex ante emission reduction (ER <sub>y</sub> ) for each VPA:	Emission reduction (ER <sub>y</sub> ) for each VPA:
	GS 7475: 10,000	GS 7475: 5,161 (15,540)
	GS 7476: 10,000	GS 7476: 5,252 (15,685)
	GS 7477: 10,000	GS 7477: 5,308 (15,877)
	GS 7478: 10,000	GS 7478: 4,933 (16,109)
13	GS 7479: 10,000	GS 7479: 4,258 (11,469)
	GS 7480: 10,000	GS 7480: 5,254 (15,856)
	GS 7481: 10,000	GS 7481: 4,775 (14,471)
	GS 7482: 10,000	GS 7482: 5,448 (15,353)
	GS 7483: 10,000	GS 7483: 5,631 (17,312)
	GS 7484: 10,000	GS 7484: 5,445 (16,185)
	<b>Total: 100,00</b>	<b>Total: 51,465 (153,857)</b>
3	From PDD, all VPAs expected to reduce the percentage of households suffering from stomach related or water-borne illness by <b>66%</b>	<b>70%</b> reduction in the percentage of households suffering from stomach related or water-borne illnesses more frequently than once every few months
5	From PDD, all VPAs expected to reduce the time required to collect water by <b>40%</b>	<b>61%</b> reduction in the time spent collecting water
6	From PDD, the number of people expected to gain access to safe water due to the project is <b>32,400</b> . Based on an additional 3,240 per VPA.	Actual additional people with access to safe water (P <sub>access</sub> ): GS 7475: 3,631 GS 7476: 3,631 GS 7477: 3,631 GS 7478: 3,352 GS 7479: 3,631 GS 7480: 3,631 GS 7481: 3,631 GS 7482: 3,910 GS 7483: 3,910

<sup>3</sup> Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

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GS 7484: 3,910

**Total: 36,868**

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### E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

>> Explanation of estimated ex ante calculations were originally provided in the PDD and are described below:

#### **SDG 3 (Good Health and Wellbeing)**

The impacts of the project towards SDG 3 is measured through the project survey. A percentage figure is calculated from the difference between the baseline and the project survey, which asks how often do you or your family suffer from stomach related illnesses, and which illnesses have they suffered from in the last year: Typhoid; Bilharzia; Cholera; or other?

It is estimated that the project will reduce waterborne illness by at least 66% per year.

#### **SDG 5 (Gender Equality)**

$$TR_y = \frac{(1.23-0.74)}{1.23} = 40\%$$

$$TR_y = (T_{b,y} - T_{p,y}) / T_{b,y}$$

Where:

TR<sub>y</sub> Total reduction time spent collecting water for project activity in year y (%)

T<sub>p,y</sub> Time spent collecting water per household per day in project (hours)

T<sub>b,y</sub> Time spent collecting water per household per day prior to project (hours)

It is estimated that the project will save roughly 0.5 hours per household per day. The project survey will monitor how this time is spent and the impact it has towards Gender Equality.

#### **SDG 6 (Clean Water and Sanitation)**

## TEMPLATE-

$$P_{access} = 3,240 = 3,480 * (1 - 0.02) * (1 - 0.05)$$

$$P_{access} = P_y * (1 - C_j) * (1 - X_{boil})$$

Where:

$P_{access}$  Number of additional persons having access to safe water in the project activity compared to the baseline scenario.

$P_y$  Number of persons having access to safe water in the project activity.

$C_j$  Expressed as a percentage, the portion of users of the project technology  $j$  who in the baseline were already consuming safe water without boiling it.

$X_{boil}$  Percentage of premises that would have used other non-GHG emitting technologies like chlorine treatment techniques, if available, in the absence of the project activity.

It is estimated that the project will provide access to safe water to an additional 3,240 people.

### SDG 13 (Climate Action)

CO<sub>2</sub> emission reductions are the indicator to demonstrate that the project has raised capacity for effective climate change-related planning and management. These are calculated according to the description in Section B of the VPA-DD.

Baseline

$$BE_{b,y} = 6944.16 * ((0.95 * 112) + 8.692) * 0.0156 = 12,468$$

$$BE_{b,y} = B_{b,y} * \left( (fNRB_y * EF_{b,fuel,co}) + EF_{b,fuel,nonco} \right) * NCV_{b,fuel}$$

Project emissions

$$PE_{p,y} = 46.29 * ((0.95 * 112) + 8.692) * 0.0156 = 83.12$$

$$PE_{p,y} = B_{p,y} * \left( (fNRB_y * EF_{p,fuel,co}) + EF_{p,fuel,nonc} \right) * NCV_{p,fuel}$$

Where:

$$B_{p,y} = (1 - 0.02) * 1,270,200 * 0.000743807 * (0 + 0.05) = 46.29$$

$$B_{p,y} = (1 - C_j) * N_{p,y} * W_{b,y} * (Q_{p,rawboil,y} + Q_{p,cleanboil,y})$$

**TEMPLATE-**

$$ER_y = (((12,468 - 83.12) * 0.855) - 0) * (1 - 0.05) = 10,059$$

$$ER_y = \left( \left( (\Sigma BE_{b,y} - \Sigma PE_{p,y}) * Up,y \right) - LE_{p,y} \right) * (1 - X_{Boil})$$

As the ERs are over 10,000 tCO2e, the cap of 10,000 tCO2e per year will be applied.

**E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD**

>> The following are remarks on the differences achieved for the SDG impacts compared to the estimates provided in the PDD:

**SDG 3**

The estimated value was close to the actual value achieved during the monitoring period. The greater reduction in stomach related and water-borne illness represent a positive outcome of the project.

**SDG 5**

The estimated reduction in time spent collecting water for ex-ante calculations was based on similar projects in other countries. The actual figure of 61% is a higher than estimated representing a greater impact than expected.

**SDG 6**

The number of people accessing safe water shows an increase on the values estimated per VPA in the PDD. As stated in Section B.2.5, the number of boreholes in each VPA has increased, thus increasing the number of people accessing safe water. Despite an increase in the number of boreholes per VPA, the number of people accessing safe water is only slightly higher than the estimated value due to the cap of 300 users per borehole placed by the Gold Standard during a previous SWS grievance review.

**SDG 13**

Despite an increase in the number of boreholes per VPA (as stated in Section B.2.5), all VPAs have fallen significantly short of the expected 10,000 ERs. This is due to the cap of 0.0004T/L for the  $W_{b,y}/W_{p,y}$  value placed by the Gold Standard during a previous SWS grievance review.

## SECTION F. SAFEGUARDS REPORTING

>> As according to the most recent PDDs for the VPAs under review, no safeguarding principles were identified as relevant to these projects. Nonetheless, the project continues to emphasize during all trainings that project beneficiaries should support vulnerable or less mobile community members to access water, to reduce the risk of marginalization. The project area does not include sites or structures of historic and cultural value, does not negatively impact the physical or economic condition of the beneficiaries, does not impact land tenure arrangements, nor occur on government-owned land, and does not encourage corruption, or break with labour laws.

## SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

### **G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.**

>>

No inputs or grievances were received during the monitoring period.

### **G.2. Report on any stakeholder mitigations that were agreed to be monitored.**

>>

No inputs or grievances were received during the previous monitoring period.

### **G.3. Provide details of any legal contest that has arisen with the project during the monitoring period**

>>

No legal contests or disputes arose during the monitoring period.



## Revision History

Version	Date	Remarks
1.1	14 October 2020	<p>Hyperlinked section summary to enable quick access to key sections</p> <p>Improved clarity on Key Project Information</p> <p>Section for POA monitoring</p> <p>Forward action request section</p> <p>Improved Clarity on SDG contribution/SDG Impact term used throughout</p> <p>Clarity on safeguard reporting</p> <p>Clarity on design changes</p> <p>Leakage section added for VER/CER projects</p> <p>Addition of Comparison of monitored parameters with last monitoring period</p> <p>Provision of an <a href="#">accompanying Guide</a> to help the user understand detailed rules and requirements</p>
1.0	10 July 2017	Initial adoption